



Why Do Electric Vehicles Charge Faster at DC Charging Stations?

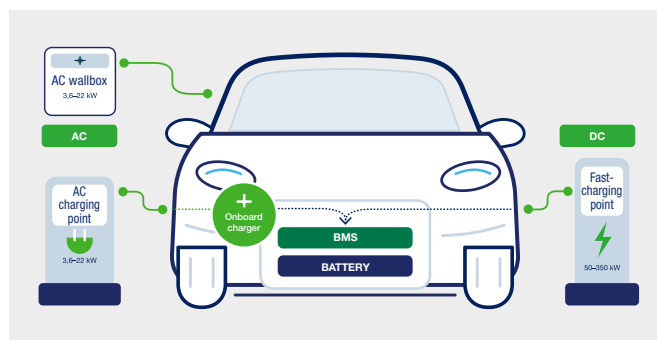
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Electric vehicles can generally be charged in two ways: using either alternating current (AC) or direct current (DC). These two charging methods are commonly referred to as slow charging and fast charging. But why is charging at DC charging stations usually so much faster?

Charging at AC charging points

In day-to-day life, the majority of privately used electric vehicles are charged at a wallbox or a public charging point. Since these outlets can only supply alternating current (AC) and an electric vehicle's traction battery requires direct current (DC), the electric power must be converted within the vehicle.

This is the job of the on-board charger (OBC), which converts alternating current to direct current via multiple converters. That makes the OBC one of the main factors affecting the speed of AC charging. Because it needs to be accommodated inside the vehicle, its performance is limited by space and weight constraints. The OBC's capacity determines the actual usable charging power. This means that, even if a charging point can deliver up to 22 kW, a vehicle with an 11-kW OBC will charge at a maximum of only 11 kW. When



charging overnight or while working, the resulting charging times are usually not a problem. But it's a different story on longer journeys.

Fast DC charging

No one wants to spend several hours charging at every stop on long journeys, like going on vacation. That's why there are DC fast-charging stations located along highways and long-distance routes. These facilities have a high-voltage connection and a powerful current transformer that converts mains electricity into direct current. This bypasses the on-board charger (OBC) and makes it possible to deliver charging power in excess of 300 kW. Under favorable conditions, it only takes about 20 to 30 minutes to increase the state of charge from about 10% to 80%.

MAHLE MX 485 charging cable

Accurate measurement of the state of health and performance of high-voltage batteries is made possible by the E-HEALTH Charge battery diagnostic solution. While the battery charges, the device delivers an independent SoH analysis within just 15 minutes, providing reliable data on the high-voltage battery's residual capacity and performance.

[> More information](#)

